



LigoWave

FWBD-2701  
LigoPTP 5-N RapidFire  
LigoPTP 5-23 RapidFire

OEM/integrators installations manual

Revision 1.0  
July 2 2015

# Contents

<b>1 Introduction.....</b>	<b>4</b>
<b>2 Applicable Module.....</b>	<b>4</b>
<b>3 Available Global Modular Approvals from LigoWave LLC .....</b>	<b>5</b>
<b>4 Additional Regulatory Conformance Testing and/or Submissions Required by the Integrator .....</b>	<b>5</b>
<b>5 Compliant/Allowable Tx Power Settings Programmed into EEPROM .....</b>	<b>7</b>
<b>6 Allowable Antennas For Use With The Radio Module.....</b>	<b>7</b>
<b>7 Antenna Placement inside the Host System and RF Safety .....</b>	<b>9</b>
<b>8 Simultaneous Transmission with Other Integrated or Plug-In Radios .....</b>	<b>9</b>
<b>9 Module May Not Be Installed by End Users .....</b>	<b>10</b>
<b>10 Required Labeling on the Outside of the Host.....</b>	<b>11</b>
10.1 FCC.....	11
10.2 Taiwan NCC .....	11
10.3 European Community R&TTE.....	12
<b>11 Required Labeling on the Module.....</b>	<b>13</b>
11.1 FCC labeling on the Module.....	13
11.2 Rest of world labeling on the Module.....	13
11.3 Instructions to download the sample global label artwork with certification IDs ....	13
<b>12 Required Regulatory Wording for User Manual/Installation Manual.....</b>	<b>14</b>
12.1 FCC compliance information.....	14
12.2 Industry Canada notice .....	15
12.3 European Community (R&TTE) user manual wording and declaration .....	16
12.4 European Community (R&TTE) Declaration of Conformity for System.....	18
12.5 Taiwan user manual wording.....	18
12.6 Korea user manual wording.....	19
<b>13 OEM Integrator Checklist.....</b>	<b>20</b>

## 1 Introduction

This document describes the steps that the OEM integrator must follow when designing and manufacturing a system utilizing a LigoWave LLC design radio module (the“Module”).

Failure to follow the instructions in this document may invalidate the FCC certification and authorization of the Module for use in the U.S. and in other countries.

The LigoWave LLC modular certifications described in this document apply only to radio conformance for the Module. The OEM integrator is responsible for all system-level EMI/EMC and Product Safety testing and certification that apply to the host system in the U.S. and other countries where the system will be marketed or sold.

## 2 Applicable Module

- Part Number: FWBD-2701 / LigoPTP 5-N RapidFire / LigoPTP 5-23 RapidFire
- FCC ID: V2V-FWBD2701 IC: 7607A-FWBD2701

**This is Module use only in the host:**

**Brand: LigoWave,  
Model: FWBD-3700.**

### 3 Available Global Modular Approvals from LigoWave LLC

Module certification is limited to those countries for which LigoWave LLC has obtained radio modular approvals. Integrators can access the current list of certified countries in one of two ways:

1. Log on to the LigoWave LLC secure customer support site. Follow the links to regulatory certifications.

Search for the folder **FWBD-2701** on the support site.

Or, if you do not have access to the customer support site, then:

2. Contact your LigoWave LLC account representative to request access to the country list and modular certificates.

OEM integrators must receive their own radio certification for any country in which the system will be sold if a modular certification for that country is not available from LigoWave LLC.

### 4 Additional Regulatory Conformance Testing and/or Submissions Required by the Integrator

- The global modular certifications apply to radio conformance for the Module only.

The OEM integrator is responsible for additional system-level EMI/EMC and Product Safety testing and certification that applies in the U.S. and other countries to the host system containing the Module. This includes, but is not limited to, Federal Communications Commission (“FCC”) Part 15 Class B Digital Emissions, China CCC, Taiwan BSMI, Korea KC, ETSI EN 301 489-17 and others.

These system-level EMC tests are to be done with the Module installed and included in the scope of the submission.

- Some of the countries for which modular certifications are provided require additional submissions, authorizations or import permission by the system-vendor or importer. The integrator is responsible for these additional actions.

By way of example, the OEM integrator must take additional action for radio certification in these countries:

Malaysia	Each importer/distributor needs to file for import permission
Singapore	Recommend use of importer’s own local radio dealer number
Israel	Additional approval certificate required for importer
Indonesia	Certificate B is required for each importer
China	Modular approval not accepted. Requires system approval
Brazil	Tablets require system level SAR evaluation and submission to Anatel.
Philippines	Modular approval not accepted. Requires system approval
Vietnam	Modular approval not accepted. Requires system approval
Indonesia	Modular approval not accepted. Requires system approval

Modular radio certification is not possible in some countries. For such countries, OEM integrators must ensure radio certification for the end system is obtained, before placing the product on the market. A current list of applicable countries can be provided by LigoWave LLC

This module is tested and obtained test report/certificates in a limited country list:

1. United States of America
2. Canada
3. European Community
4. Japan
5. Taiwan

Please contact your LigoWave LLC account representative if you have questions about the additional regulatory conformance testing and/or related submissions.

## 5 Compliant/Allowable Tx Power Settings Programmed into EEPROM

This file contains the allowable transmit power settings that are to be programmed into the Module during original manufacturing:

CTL File Name: FWBD-2701\_ctl.art

**NOTE:** Programming in higher values than provided for in this file will invalidate all radio certifications for this module.

OEM integrators can access the file one of two ways:

- Log on to the LigoWave LLC secure customer support site, then:
  - a. Download the Atheros Radio Test (ART) package
  - b. Browse to this folder in the zip package: **\FWBD-2701**
  - c. Find **CTL File** (file name reference above)

OR, if you do not have access to the customer support site, then:

- Contact your LigoWave LLC account representative to request the CTL file.

## 6 Allowable Antennas to Use with the Radio Module

- For FWBD-2701 board Hardware version 004: Support external antennas with MMCX connector.

**Table 2 Allowed Maximum Gain (dBi), Type for external antenna, Including Antenna Cable Loss**

Brand	Model	5150~ 5350 Gain with cable loss (dBi)	5470~ 5725 Gain with cable loss (dBi)	5725~ 5850 Gain with cable loss (dBi)	Antenna Type
FLY	FS-5800F	3.25	3.72	3.45	Omni
LigoWave	FWA-8 FWA-30	16.96	17.43	17.82	Sector
LigoWave	FWA-1-1	21.13	21.42	22.51	Panel

**WARNING:** Use of other antenna types or the same type of external antenna with higher gain is not allowed without additional testing and appropriate FCC approval.

Contact your LigoWave LLC account representative for additional guidance if you decide to use different antenna types or higher gain antennas in the end system.

Some examples of antenna types not considered the same type as OMNI are sector/panel, external PCB trace, patch, and chip antennas.

In addition, regulatory agencies in Japan, Korea, and Taiwan require submission of antenna specification sheets for all antenna models used with the LigoWave LLC module. This notification process must be followed by the integrator before original product launch and whenever new host systems (with new antenna models) are launched.

## 7 Antenna Placement inside the Host System and RF Safety

The FCC and other countries' regulatory bodies impose strict conditions and limitations on the RF exposure levels of end products. Acceptable RF exposure levels for this Module depend on transmit power, the location of the transmitting antenna(s) inside the host system, the expected separation of the transmitting antennas to the end user, as well as if there is/are collocated RF transmitter(s) in the same host system. OEM integrators must take great care to ensure each host system complies with the applicable RF exposure requirements.

**NOTE: The antenna-to-user separation distance must be greater than 119cm (1.19m). (Mobile category per defined in Part 2.1091)**

You may contact your LigoWave LLC account representative with any questions regarding compliance of the host system(s) with these restrictions.

**NOTE:** The restrictions do not apply to a receive-only antenna.

## 8 Simultaneous Transmission with Other Integrated or Plug-In Radios

The FCC imposes conditions and limitations when additional radio(s) are co-located in the same host system as the LigoWave LLC Module *with capability to transmit simultaneously*. The detailed rules from the FCC are described in various Knowledge Database publications that may be found using the instructions below. Co-locating other radios such as an integrated or plug in Wireless WAN/cellular radio with the LigoWave LLC Wireless LAN module requires additional evaluation and possibly submission for authorization from the FCC.

Because the rules are highly dependent on the characteristics of the particular radios that are co-located and simultaneously transmitting, the OEM integrator should seek guidance from a knowledgeable test lab or consultant to determine if additional testing and FCC certification is required. In this case, failure to evaluate and follow the required FCC procedures will invalidate the FCC certification of the Module and end system.

To download the FCC rules for collocated radios:

1. <https://apps.fcc.gov/oetcf/kdb/index.cfm>
2. Enter 616217 in the 'publication number' search box
3. Download latest applicable version of KDB 616217 document.

For expert advice regarding collocation rules, we recommend you contact an FCC-approved Telecommunication Certification Body ("TCB"):

4. <https://apps.fcc.gov/oetcf/kdb/index.cfm>.
5. Choose your country and or state from the pull-down list.
6. Scroll through the search results and choose a TCB contact from which to seek advice.



**To ensure total compliance of RF exposure requirements, LigoWave LLC requires that all its PCOEM customers submit all their host platforms integrated with LIGOWAVE LLC certified modules for Host Platform RF Exposure Assessment under a LigoWave LLC established program. All host platform must be submitted to a LigoWave LLC designated third party lab for professional assessment to determine if the host system is in compliance of RF exposure requirements or if it will need to undergo further SAR test and class II permissive change approvals before it can be placed onto the US and Canada market.**

## **9 Module May Not Be Installed by End Users**

FCC rules require this Module to be installed in host systems at the factory by the OEM integrator. Thus, end users of the system may not install the Module. Therefore, the host product user instructions must not advise the end user on how to access or remove the Module. Additional FCC authorization/filing is needed to allow end user installation of radio modules.

## 10 Required Labeling on the Outside of the Host

**NOTE:** Explanatory text in red font must not be included in the final label.

### 10.1 FCC

- The FCC requires a label on the outside of the host system visible to the end user. Example wording is:

Contains:  
FCC ID: XXX-XXXXXXX  
IC: XXXXX-XXXXXXX

(Replace X's with actual IDs found in section 2).

- The FCC requires a logo signifying emissions compliance on the outside of the host system.

Additional options are available for placement of the FCC label on the host. Please refer to the FCC Knowledge Database KDB784748 found at <https://apps.fcc.gov/oetcf/kdb/index.cfm>.


**NOTE:** The Integrator is responsible to perform FCC Part 15 Class B digital emissions testing on the end system with the radio Module installed. The FCC logo below should not be affixed unless the OEM integrator has obtained the necessary Part 15 approval, e.g., self-declaration of conformity.

If the host system is approved to FCC Class B digital emissions limits under a grant of certification issued by a TCB, the FCC ID number shown on the grant should be used on the label instead of the FCC logo below.



### 10.2 Taiwan NCC

Taiwan NCC requires a label on the outside of the host system visible to the end user. The required wording is:

本產品內含射頻模組:  XXXXXXXXXXX

(Replace X's with actual IDs found in section 2).

### 10.3 European Community R&TTE

- The European Community R&TTE Directive requires the CE Marking shown below on the outside of the host AND on the outside of the shipping container/packaging:



- The European Community R&TTE Directive also requires the following note to consumers on the outside of the shipping container/packaging:

<b>Important Notice: This product is a Radio LAN device operating in 2.4 &amp; 5 GHz bands for Home and Office use in the E.E.A. States with restrictive use are highlighted in grey. Refer to user documentation for details.</b>			
AT	BE	CH	CY
CZ	DE	DK	ES
FI	FR	GB	GR
EE	HU	IT	IE
IS	LI	LT	LU
LV	MT	NL	NO
PL	PT	SE	SI
SK			

**NOTE:** The Integrator is expected to translate the text in this Section into the appropriate local languages for the European countries in which the product will be marketed or sold.

## 11 Required Labeling on the Module

### 11.1 FCC labeling on the Module

The Integrator must ensure that the FCC ID (as indicated in section 2) is affixed on the Module along with other country certification numbers and logos as described herein.

**NOTE:** The Module ODM may affix regulatory labeling at time of Module manufacturing. However, the OEM Integrator must ensure the Module label is complete, correct and applicable for all countries to which the host system is to be imported, marketed, or sold.

### 11.2 Rest of world labeling on the Module

The Integrator must ensure the Module includes a global regulatory label with certification numbers and logos for all target countries. The system integrator is responsible to confirm the final regulatory label on the radio Module contains all required certification IDs for all countries in which the system will be marketed or sold.

It is recommended that the OEM Integrator implement a review and sign-off process as well as change control process with each Module ODM to ensure that the module label meets the OEM Integrator's requirements.

LigoWave LLC provides sample artwork with the applicable certification numbers for this Module. The provided .PDF document can be opened using Adobe Illustrator so the sample artwork can be copied and modified as needed. Therefore the final label produced by the Module manufacturer will vary from this sample. However, the logos and certification numbers must be those shown in the sample global label.

Contact your LigoWave LLC account representative with any questions regarding module labeling.

### 11.3 Instructions to download the sample global label artwork with certification IDs

1. Log on to the LigoWave LLC secure customer support site. Follow the links to regulatory certifications.

**NOTE:** Search for the folder **FWBD-2701** in the support site.

2. Find the folder: **Sample Labeling for Module.**
3. Download the PDF file found in the folder.

OR, if you don't have access to the customer support site, then:

Contact your LigoWave LLC account representative to request the Sample Label file.

## 12 Required Regulatory Wording for User Manual/Installation Manual

The integrator must include text in the user manual meeting the regulators' requirements. The text below or similar wording should be used.

**NOTE:** Text in red font must be replaced.

### 12.1 FCC compliance information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This product does not contain any user serviceable components. Any unauthorized product changes or modifications will invalidate warranty and all applicable regulatory certifications and approvals, including authority to operate this device.

FCC Part 15 Digital Emissions Compliance

We **[System Manufacturer Name, Address, Telephone]**, declare under our sole responsibility that the product **[System Name]** complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**WARNING:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No.004-000-00345-4.

**(Notice for 5GHz)**

Operations in the 5.15-5.25GHz band are restricted to indoor usage only. (For 5GHz only)

**(RF exposure statement – For Mobile category )**

Radiation Exposure Statement:

The product comply with the FCC Mobile RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

## **12.2 Industry Canada notice**

This device complies with Canadian RSS-247.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Ce dispositif est conforme à la norme CNR-247 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

**(Notice for 5GHz)**

**Caution :**

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit; and

(iii) the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

(iv) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

**Avertissement:**

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

- (i) les dispositifs fonctionnant dans la bande 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
- (ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5 250-5 350 MHz et 5 470-5 725 MHz doit se conformer à la limite de p.i.r.e.;
- (iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.
- (iv) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

#### **(RF exposure statement – For Pobile category)**

Radiation Exposure Statement:

The product comply with the Canada Mobile RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

**The antenna-to-user separation distance must be greater than 1.27m**

### **12.3 European Community (R&TTE) user manual wording and declaration**

**NOTE:** Text in **red font** must be replaced with name of company responsible for placing the system on the European Community Market.

**Europe – EU Declaration of Conformity**



Marking by the above symbol **indicates** compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC). This equipment meets the following conformance standards:

EN300 328, EN 301 893, EN 301 489-17, EN60950, EN 62311

<b>cs</b> Česky [Czech]	<b>[COMPANY NAME]</b> tímto prohlašuje, že tento Radiolan je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
<b>da</b> Dansk [Danish]	Undertegnede <b>[COMPANY NAME]</b> erklærer herved, at følgende udstyr Radiolan overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
<b>de</b> Deutsch [German]	Hiermit erkläre <b>[COMPANY NAME]</b> dass sich das Gerät Radiolan in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
<b>et</b> Eesti [Estonian]	Käesolevaga kinnitab <b>[COMPANY NAME]</b> seadme Radiolan vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
<b>en</b> English	Hereby, <b>[COMPANY NAME]</b> , declares that this Radiolan is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
<b>es</b> Español [Spanish]	Por medio de la presente <b>[COMPANY NAME]</b> declara que el Radiolan cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
<b>el</b> Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ <b>[COMPANY NAME]</b> ΔΗΛΩΝΕΙ ΟΤΙ Radiolan ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
<b>fr</b> Français [French]	Par la présente <b>[COMPANY NAME]</b> déclare que l'appareil Radiolan est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Íslenska [Icelandic]	Hér með lýsir <b>[COMPANY NAME]</b> yfir því að Radiolan er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
<b>it</b> Italiano [Italian]	Con la presente <b>[COMPANY NAME]</b> dichiara che questo Radiolan è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
<b>lv</b> Latviski [Latvian]	Ar šo <b>[COMPANY NAME]</b> deklarē, ka Radiolan atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
<b>lt</b> Lietuvių [Lithuanian]	Šiuo <b>[COMPANY NAME]</b> deklaruoja, kad šis Radiolan atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
<b>mt</b> Malti [Maltese]	Hawnhekk, <b>[COMPANY NAME]</b> , jiddikjara li dan Radiolan jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
<b>hu</b> Magyar [Hungarian]	Alulírott, <b>[COMPANY NAME]</b> nyilatkozom, hogy a Radiolan megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
<b>nl</b> Nederlands [Dutch]	Hierbij verklaart <b>[COMPANY NAME]</b> dat het toestel Radiolan in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
<b>no</b> Norsk [Norwegian]	<b>[COMPANY NAME]</b> erklærer herved at utstyret <i>Radiolan</i> er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.
<b>pl</b> Polski [Polish]	Niniejszym <b>[COMPANY NAME]</b> oświadcza, że Radiolan jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
<b>pt</b> Português [Portuguese]	<b>[COMPANY NAME]</b> declara que este Radiolan está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
<b>sl</b> Slovensko [Slovenian]	<b>[COMPANY NAME]</b> izjavlja, da je ta Radiolan v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
<b>sk</b> Slovensky [Slovak]	<b>[COMPANY NAME]</b> týmto vyhlasuje, že Radiolan spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
<b>fi</b> Suomi [Finnish]	<b>[COMPANY NAME]</b> vakuuttaa täten että Radiolan tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.



sv Svenska [Swedish]	Härmed intygar [COMPANY NAME] att denna Radiolan står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
----------------------	---

**Table 2 Restrictions for use of 2.4 GHz frequencies in European Community countries. The restriction described below follows ERC/REC 70-03 (Edition of September 2011). It is recommended to check latest edition for updated restrictions.**

France:	The outdoor use is limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz.
Italia:	For private use, a general authorisation is required if WAS/RLAN's are used outside own premises. For public use, a general authorisation is required.

## 12.4 European Community (R&TTE) Declaration of Conformity for System

In addition to including the radio conformity wording described in the previous section in the user manual, the end integrator must also create and sign a European Declaration of Conformity (DoC) for all European Directives applicable to the end product. At a minimum, this will be a DoC per the R&TTE Directive covering Radio, EMC, product Safety and RF Exposure essential requirements. The DoC must reference harmonized standards used for all radios present in the system.

Full details of R&TTE DoC requirements can be found at:  
[http://www.ec.europa.eu/enterprise/sectors/rtte/index\\_en.htm](http://www.ec.europa.eu/enterprise/sectors/rtte/index_en.htm)

**NOTE:** An image of the DoC signed by the OEM integrator may be included in the user manual or a link to the DoC on the integrator's company web site should be provided in the user documentation.

## 12.5 Taiwan user manual wording

台灣:國家通訊傳播委員會

低功率電波輻射性電機管理辦法

第十二條經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

在 5.25-5.35 赫兹(GHz)頻帶內操作之無線資訊傳輸設備，限於室內使用。(For 5GHz only)

## **12.6 Korea user manual wording**

### **Korea KCC**

해당무선설비는전파혼신가능성이있으므로인명안전과관련된서비스는할수없음

### 13 OEM Integrator Checklist

The party below will implement the LigoWave LLC Module in host systems in accordance with the instructions specified in this document and the documents referenced herein.

- The OEM integrator will ensure the Module is integrated in a host systems using only the approved antenna model(s) described in this document.
- The OEM integrator will ensure the antenna placement inside the host system will maintain the required spacing to end user for RF Exposure compliance, as specified in this document.
- If other radios are integrated inside the host with the LigoWave LLC Module, the OEM integrator will contact its test lab, TCB or LigoWave LLC to determine if additional FCC compliance evaluation is required to meet FCC collocation rules.
- The OEM integrator will ensure end user documentation will contain the specified regulatory wording and ensure the host system and the Module itself are labeled as specified in this document.
- The OEM integrator will ensure the Module is programmed in the factory with compliant transmit power not exceeding the levels specified in this document.

**LigoWave LLC requests that the OEM integrator acknowledge its receipt of this document and the above instructions. You may contact LigoWave LLC with any questions concerning this document or the responsibilities of the OEM integrator.**

Company Name	<hr/>	Signature	<hr/>
Company Address	<hr/>	Name	<hr/>
	<hr/>	Title	<hr/>
		Email	<hr/>
		Phone	<hr/>
		Date	<hr/>

**NOTE:** Please email a signed and completed copy of this acknowledgment to support@ligowave.com.